PROFESSIONAL FORUM

The 100-meter Combat Shotgun

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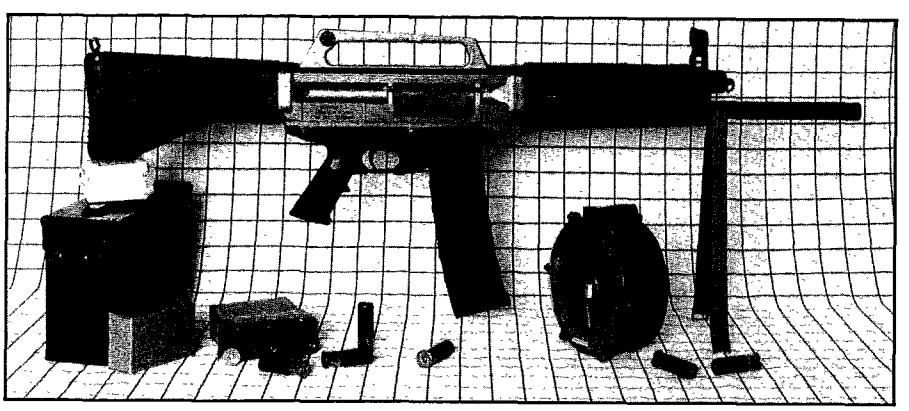
For nearly 100 years, the Army's standard-issue shotgun has been a slide-action 12-gauge. While the infantryman's rifle has been continually improved to meet the ever-changing requirements of combat, the issue shotgun of the 1990s does not differ in form and function from its World War I ancestor.

The ammunition situation is not much better, with a nine-pellet loading of 00 ("double-ought") buckshot being the longtime standard. This round has been refined from the paper-cased shells originally used, through the all-brass M19, to the current plastic-cased M162 ammunition. As with the shotgun, however, the performance of this ammunition differs little from that used at the beginning of the century. Consequently, the shotgun has always been considered a short-range weapon, suitable for jungle warfare and guard duty but inadequate as a general-purpose battle instrument.

Improving the combat utility of the shotgun requires a dual-path effort: A state-of-the-art shotgun—designed expressly for the rigors of warfighting—should be developed; and a new generation of ammunition with better downrange performance must be created.

The most significant flaw in conventional shotguns is probably the slow and awkward loading procedure; with the tubular magazine, only one round at a time can be inserted into the weapon. As the British security forces discovered in Malaya—and as U.S. soldiers relearned in Vietnam—the ability to reload quickly during a firefight can be vital to mission success. A detachable box or drum magazine (or conceivably a belt-feed) is a necessity if the combat shotgun is ever to achieve its full potential.



The ideal combat shotgun would have a straight-line stock and be fed by detachable magazines.

Additionally, an advanced shotgun should be semiautomatic, but only if reliable functioning under field conditions can be assured. This reliability factor has been the primary reason self-loading smoothbores have not superseded the manually operated designs.

Although some people advocate the incorporation of select-fire capability into any new weapon, this hardly seems critical. It is difficult to imagine a likely scenario in which automatic fire would really be necessary, and shotgun ammunition is much too heavy and bulky to be expended this way.

Finally, the shotgun would benefit greatly from the adoption of a "straight-line" stock. Conventional stock designs were configured for hunting guns. A properly designed stock could improve control and reduce felt recoil. While control in rapid fire is of little importance to the hunter, it can be very important to the point man on a jungle patrol.

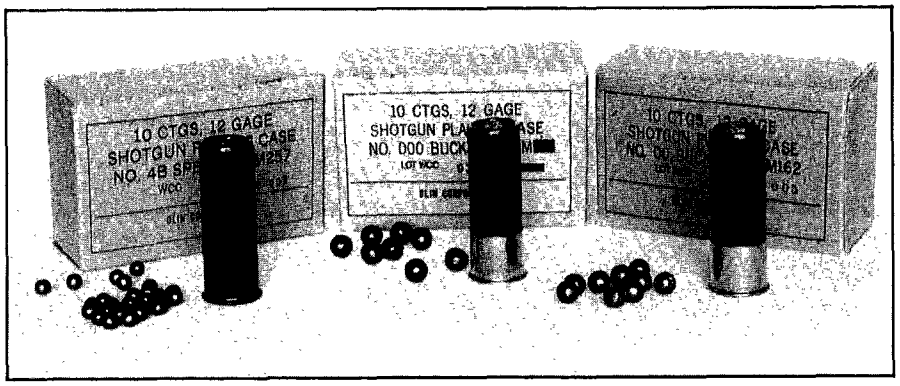
Although there has been some research and development in ammunition, the standard multiple projectile round launches nine .33-caliber lead pellets at a nominal 1,325 feet per second. The current 00 buckshot load is definitely more effective than previous generations. Its muzzle velocity is 200

feet per second faster than the old M19 round, and the use of granulated filler material improves shot patterns by reducing pellet deformation during firing. Even so, at the engagement distances of 50 to 150 meters where most infantry combat occurs, the "double-ought" round is severely handicapped; its terminal energy at extended range is too slow to assure target incapacitation.

One solution to this problem is to increase the caliber of the individual pellets. This would require going to 000 ("triple-ought") buckshot, the largest size that can be loaded in useful numbers into the 12-gauge shell. Eight of the .36-caliber pellets, each of which is 27 percent heavier and nine percent larger than 00 buckshot, are also discharged at 1,325 feet per second. The 2¾-inch load is a nondevelopmental item (NDI) currently being manufactured and marketed by the major producers of shotgun ammunition. This loading, like the M162 round, uses conventional soft-lead pellets, but penetration capability is about 50 percent better than standard 00 buckshot.

As good as the 000 load is in NDI form, it can benefit from the same technology that has improved shotgun ammunition for the civilian market. This involves using pellets made from lead hardened with antimony, polished for an extra-smooth spherical shape, then plated with copper or nickel for additional toughness. Buffer material similar to that of the standard M162 load is used to keep the pellets from colliding with one another. Using a shot cup completely isolates the projectiles from the bore, so there is no damaging metal-to-metal contact. The pellets stay much rounder (compared to standard, soft-lead buckshot), they fly straighter (giving tighter patterns), and they retain velocity better (for increased target penetration). The end result is a high-performance (HP) round that is far superior to conventional buckshot.

Sadly, none of the manufacturers have 2¾-inch, HP 000 in their product lines. They do, however, offer a 3-inch magnum load that holds 10 hardened, plated pellets. A small quantity of two versions of this loading were acquired for evaluation of the HP concept.



Generic 000 buckshot (center) gives 50 percent better penetration than standard M162 00 buck (right) and three times as much as M257 #4 buckshot.

TEST LOADS

LOAD	SHELL	SHOT	PELLETS	SHOT CUP
1	3-inch	000 Buck	8	No
2	3-inch	000 Buck	8	Yes
3	2 ¾-inch	000 Buck	8	No
4*	2 ¾-inch	00 Buck	9	No

*M162, used as control load.

Table 1

NUMBER OF HITS ON E-TYPE SILHOUETTE
(Three Rounds Fired Each Load)

LOAD	25m	50m	75m	100m
1	8-8-7* (96%)	4-2-5 (46%)	2-4-2 (33%)	0-1-1 (8%)
2	8-8-8 (100%)	5-4-7 (67%)	3-3-3 (37%)	2-1-0 (13%)
3	8-6-7 (88%)	3-4-3 (42%)	1-2-0 (13%)	0-1-0 (4%)
4	9-9-8 (96%)	4-5-5 (52%)	2-3-1 (22%)	0-0-2 (7%)

*Percentage denotes average hits out of three rounds.

Table 2

PENETRATION

	LOAD 3	LOAD 4
¾-inch pine board, 50m	Yes	Yes
¾-inch pine board, 100m	Yes	Yes
¾-inch pine board, 150m	Yes	Partial
Sheet metal baffles, 25m	3	2

Table 3

In the evaluation, two pellets were removed from each shell and their space was filled with additional buffer material, thereby creating eight-pellet trial loads.

A pattern board was set up for test shots to be fired at 25, 50, 75, and 100 meters. It was anticipated that at least three rounds of each load (Table 1) would be patterned at each range. Two experimental rounds of 3-inch, 000 buck, with eight pellets were

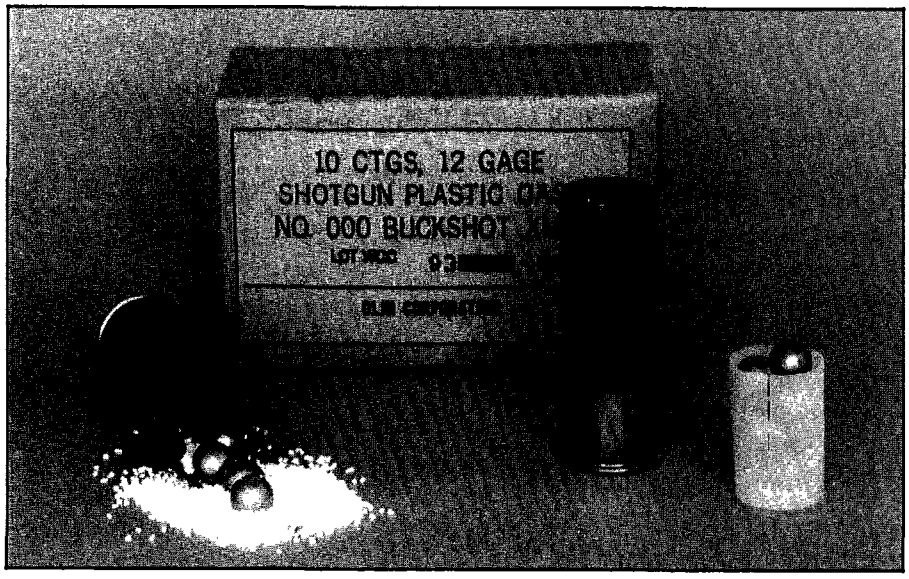
evaluated—Load 1 with no shot cup and Load 2 with shot cup. Also tested were a generic 2¾-inch, 000 buck, eight-pellet round (Load 3) and, for control purposes, the M162, 2¾-inch, 00 buck, nine-pellet round (Load 4). All loads were fired from a shotgun with cylinder bore, which is the typical choke for military smoothbores.

The first to be patterned was the control load (Load 4), which performed with nine out of nine pellets striking the silhouette target at 25 meters. This dropped to five pellets at 50 meters, two at 75 meters, and no assurance of a hit at 100 meters.

The generic, eight-pellet, 000 buck load (Load 3), exhibited patterns that were not quite as tight as the control round, getting seven hits out of eight at 25 meters and only three out of eight at 50 meters. The silhouette absorbed few hits at the longer ranges.

With the modified, 3-inch, 000 loads, the experiment did show some promising results (Table 2). Load 1 showed patterns comparable to those of the M162 and slightly better than those of the generic 000 buck. Load 2 achieved superior performance, producing tighter patterns at all ranges than any of the other loads. As with Load 1, this load uses hard, copper-plated shot surrounded by buffer material. In addition, the projectiles appear rounder, smoother, and more highly polished. Also, Load 2 uses a shot cup, protecting the pellets from being scuffed and scraped as they pass down the bore. The combination of these factors is apparently crucial to extending the effective range of combat shotgun ammunition to the maximum.

Limited testing of penetration capability was also conducted using Loads 3 and 4. (Modified 000 loads were not used in the penetration tests, as all had been expended in the pattern evaluations.) In the first test, a ¾-inch pine board was set up, first at 50 meters, then at 100 meters, and finally at 150 meters. All of the ammunition penetrated the board at the short and middle distances. At 150 meters, the M162 00 pellets were stopped, but the generic 000 punched through the pine board without apparent difficulty.



The ideal long-range combat load would have eight polished, hardened, and plated 000 pellets, protected by buffer and shot cup.

A sheet-metal baffle, composed of .030-inch steel plates spaced three inches apart, was positioned at 25 meters. M162 00 buckshot penetrated two layers and made a minor dent in the third, while the generic 000 buck easily punched through three baffles. Previous experience with HP 00 ammunition (which can pierce three layers at 25 meters) indicates that an HP 000 round may be able to penetrate four of the steel plates, giving such a load twice the penetration of the current M162 ammunition.

Since even HP 000 buckshot is unlikely to put more than one pellet per round into the target at ranges beyond 75 meters, it becomes necessary to adopt the tactic of firing several shots in quick order. Indeed, this may be the only circumstance that could even remotely justify the full-automatic firing of a shotgun, because the target area needs to be rapidly saturated to neutralize the opponent before he can return fire. This tactic can also be efficiently implemented with a semiautomatic weapon, but a slide-action gun will be significantly less effective for most operators.

In the past decade, some manufacturers have developed self-loading, fighting shotguns that incorporate large-capacity, detachable magazines; unfortunately, few have actually attained series production. There is still room for improvement in combat shotgun design and, hopefully, a truly advanced weapon will some day be manufactured.

In the meantime, the ammunition companies should be urged to produce a high-performance, 2¾-inch, 000 buckshot round that will maximize the long-range capability of the present generation of military shotguns.

This can be standard pressure ammunition, with eight hardened, plated pellets at 1,325 feet per second or, possibly, a high-velocity round that sends the eight 000 shot on their way at more than 1,400. Either of these options would be vastly superior to the M162 and would greatly increase the overall effectiveness and utility of the shotgun.

Whether the user of the combat shotgun is a military policeman confronting armed felons or a special operations soldier tracking down guerrillas, he deserves the best ammunition that can be made, and our Nation has the capability to develop and field that ammunition.

Stanley C. Crist served as a scout section leader in the 3d Battalion, 185th Armor. He has written numerous articles on small arms testing and evaluation, some of which have appeared in INFANTRY.